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Determination of N-trans-feruloyltyramine content and nitric oxide inhibitory and antioxidant activities of *Tinospora crispa*

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Tinospora crispa or 'Boraphet' is widely used as a folk medicine in Thailand. It is one ingredient in Thai folk remedies for maintaining good health. A decoction of the stems, leaves and roots is used to treat fever, cholera, diabetes, rheumatism and snake-bites. Also it reduces thirst, internal inflammation, and increases appetite [1]. N-trans-Feruloyltyramine was isolated from *T. crispa* and this compound showed high anti-nitric oxide activity [2]. This study was designed to determine the N-trans-Feruloyltyramine content and investigate the nitric oxide inhibitory activity in different types of *T. crispa* crude extracts. The antioxidant activity was also studied.

T. crispa powdered sample was extracted with water by decoction method and another sample was extracted by Soxhlet apparatus using 95% ethanol as the extraction solvent. The N-trans-Feruloyltyramine contents of the aqueous extract and the ethanolic extract were determined by LC-MS/MS. These extracts were tested for their anti-inflammatory activity by determination of inhibitory activity on lipopolysaccharide (LPS) induced nitric oxide (NO) production in RAW 264.7 cell lines using Griess reagent. The antioxidant activity of the ethanolic extract was investigated by DPPH method. Results indicated that the yield of the aqueous extract of *T. crispa* was higher than the ethanolic extract whereas the N-trans-Feruloyltyramine

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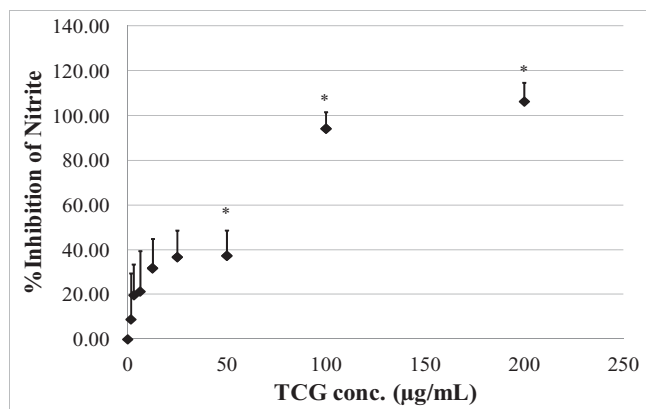


Fig. 1 – % Inhibition of nitric oxide of the ethanolic *T. crispa* extract.

contents of the ethanolic extract were higher than the aqueous extract. The ethanolic extract of *T. crispa* exhibited high inhibitory activity on lipopolysaccharide (LPS) induced nitric oxide (NO) production in RAW 264.7 cells with IC_{50} value of

53.89 $\mu\text{g/ml}$ as shown in Fig. 1. It was indicated that the nitric oxide inhibitory activity of *T. crispa* extract was related to the *N-trans-Feruloyltyramine* content. The antioxidant activity of the ethanolic extract estimated by IC_{50} value was 88.56 $\mu\text{g/ml}$. These results support the use of *T. crispa* in pharmaceutical and cosmetic products.

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